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ABSTRACT

The 4MAT system of instructional change is described. The 4MAT system is an eight-step cycle of instruction that capitalizes on individual learning styles and brain-dominance processing preference. Four major learning styles are recognized: (1) imaginative; (2) analytic; (3) common sense; and (4) dynamic. Because in each style there are people with right-mode, left-mode, and whole-brain dominance, the 4MAT system uses techniques for each mode throughout the learning styles. The 4MAT system is conceptualized as a four-quadrant circle that makes an eight-step learning cycle. It is recommended that the cycle be used in school districts for at least two years to see benefits for students and teachers. Evaluations are ongoing for 16 school districts in the United States and Canada committed to the 4MAT system. Emphasis in successive quadrants is on personal meaning, content and curriculum, usefulness, and creativity. Moving through the cycle, teachers examine their own learning style preferences, and in so doing they become more sensitive to student learning styles and instructional needs. In quadrant form, in the second year of 4MAT implementation, evaluation practices change as learners are brought to accept greater responsibility for self-evaluation. It is also possible to use the 4MAT process as a system approach, with roles for principals, teachers, and students in each quadrant. Eight figures illustrate the discussion, and a 13-item bibliography is included. (SLD)

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Learning Styles and Schools: Making It Happen
by Bernice McCarthy

This article describes our attempts to mainstream learning styles technology into the school districts where we have worked. The districts reported here[1] commited to long-range implementation of 4MAT in time frames ranging from two to five years. The projects included training, practice and feedback sessions, summative and formative evaluations and in year three of the projects, events designed specifically to foster enthusiasm for continuing renewal. In some of the districts, we went on-site to do the training. In others staff came to us, and did the training themselves back home. In both instances evaluations were ongoing. This article is a report on what we have learned and are learning about long-range implementation strategies, learning styles technology and 4MAT. It begins with an overview of The 4MAT System[2].

The 4MAT System®--Teaching to Learning Styles with Right/Left Mode Techniques: An Overview

The 4MAT System, which I developed in 1972, is an eight-step cycle of instruction that capitalizes on individual learning styles and brain dominance processing preferences. It provides a way to organize how we teach based on differences in the way people learn. It is designed to raise teacher awareness as to why some things work with some learners while others do not. 4MAT is based on research[3] from education, psychology, neurology and management and includes the theories of David Kolb, Carl Jung, Jean Piaget, John Dewey, and brain researchers Joseph Bogen, Gabriele Rico, Betty Edwards, John Bradshaw, and Norman Nettleton.

Inherent in the 4MAT System are two major premises:
1) people have major learning styles and hemispheric (right- left-mode) processing preferences, and
2) designing and using multiple instructional strategies in a systematic framework to teach to these preferences can improve teaching and learning.

Learning Styles are approaches to learning developed by individuals over time. Differences in learning styles depend on many things: who people are, where they are, how they see themselves, what they pay attention to, and what people ask and expect of them. Individual learning style preferences are favoritisms that result in keen understandings that are often instantaneous, as well as serious misunderstandings that are often felt in deeply emotional ways. Learning Styles are complex patterns of individuality that bias what we see and how we see it. All of us take in knowledge from experience, we are in it to begin with. All of us feel, reflect, think, and do, but we linger at different places along the way. And these lingerings form our learning style preferences.

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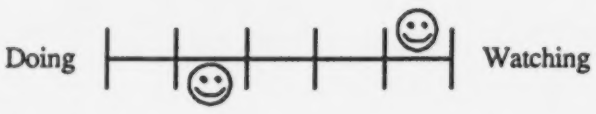
According to David Kolb, whose work is the theoretical base for 4MAT, there are two major differences in how people learn. **The first is how they perceive, the second is how they process.**

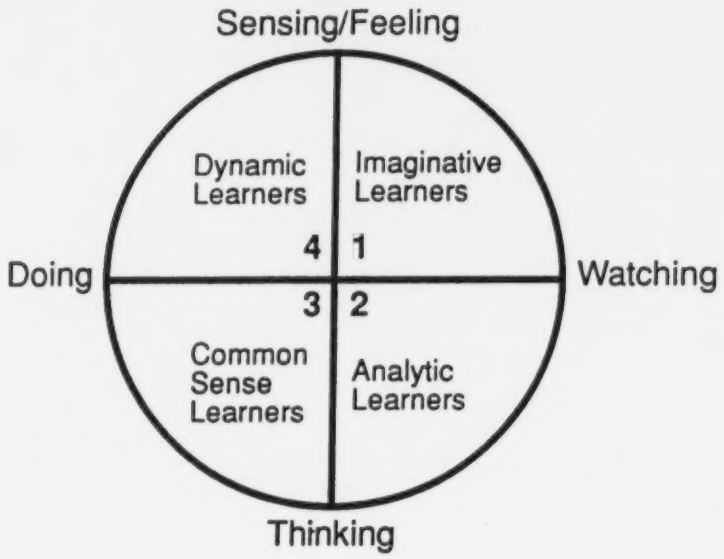
People **perceive** reality differently. In new situations, some people's primary response is to sense and feel their way, while others think things through. No one uses one response to the total exclusion of the other. However, in their reactions, people hover near different places on a continuum, and that hovering place is their most comfortable place.

Those who perceive in a sensing/feeling way project themselves into the reality of the now. They tend to the actual experience itself. They immerse themselves directly, they perceive through their senses. They intuit. On the other hand, those who think through experiences tend more to the abstract dimensions of reality. They analyze what is happening. Their intellect makes the first appraisal, they reason experience, they approach experiences logically. While both kinds of perception are quite different from each other, both complement rather than exclude the other. Both are equally valuable. And both have strengths and weaknesses. Most importrant of all, every learner needs both for the fullest possible entry into understanding experience.

Perception alone, however, does not equal learning. The second major difference in how people learn is how they **process** experience and information, how they make it part of themselves. Some people are watchers first, others are doers first. Both ways of processing information and experience are equally valuable and both have their own strengths and weaknesses. The watchers reflect on new things, they filter them through their own experience to create meaning in a slow, deliberate choosing of perspectives. The doers act on new information immediately. They reflect only after they have tried it out. They need to do it, to extend themselves into the world, in order to make it theirs.



The processing dimension is a continuum that ranges from the need to internalize to the need to act. Watchers need to refine their reflective gifts while developing the courage to experiment and try. And doers need to refine their experimenting gifts while developing the patience to watch reflectively. When these two dimensions of perceiving and processing are juxtaposed, a four-quadrant model is formed. The resulting structure delineates the qualities of four major learning styles.



Type One: Imaginative Learners

They perceive information concretely and process it reflectively. They integrate experience with the Self. They learn by listening and sharing ideas. They are imaginative thinkers who believe in their own experience. They work for harmony and need to be personally involved. They seek commitment and are interested in people and culture. Sometimes, because they see all sides, they have difficulty making decisions. They seek meaning and clarity. They find school too fragmented and disconnected from the personal issues that they find most interesting. They struggle to connect the content of schooling with their need to grow and understand their world.

Type Two: Analytic Learners

They perceive information abstractly and process it reflectively. They devise theories by integrating their observations into what is known. They learn by thinking through ideas. They need to know what the experts think. They value sequential thinking. They need details, and are thorough and industrious. They enjoy traditional classrooms and find ideas fascinating. Sometimes they enjoy ideas more than people, they also can seem cool and aloof. They seek intellectual competence and personal effectiveness. They are highly skilled verbally and generally are avid readers. They find school well suited to their needs.

Type Three: Common Sense Learners

They perceive information abstractly and process it actively. They integrate theory and practice. They learn by testing theories and applying common sense. They are pragmatists. They believe if something works, then use it. They are down-to-earth problem- solvers who resent being given answers. They value strategic thinking. They are skills oriented and experiment and tinker with things. They need to know how things work. They edit reality and cut right to the heart of things. They need to work on real problems and so they find school frustrating . They want to see how what they are learning is of immediate use to them.

Type Four: Dynamic Learners

They perceive information concretely and process it actively. They integrate experience and application. They learn by trial and error. They are enthusiastic about new things. They are adaptable, they even relish change. They excel when flexibility is needed. They often reach accurate conclusions in the absence of logical justification. They are risk-takers who are at ease with people. They are sometimes seen as manipulative and pushy. They seek to influence. They find school tedious and overly sequential. They need to be allowed to pursue their interests in diverse ways, and so they too are frustrated with the structure of our schools.

Hemisphere Processing Modes

Brain Hemisphere Research further expands the consideration of learning styles. Current research on right and left brain hemispheres include the following findings:
1) the two halves of the brain process information differently;
2) both hemispheres are equally important in terms of whole brain functioning and
3) individuals rely more on one information processing mode than the other, especially when they approach new learning. (Bogen, 1969, 1975)[4]

Research typically describes the left mode as serial, analytic, rational and verbal. The right mode is described as global, visual and holistic, able to see patterns and connections.

Left-mode processing is systematic. Analysis and planning are key strategies. Problems are solved by looking at the parts, and sequence is critical. Right-mode processing seeks patterns. Problems are solved by looking at the whole picture. Intuition, beliefs and opinions are key processing strategies. Jeremy Campbell in his succinct book on the brain, *The Improbable Machine* (1989)[5] in a chapter entitled "Farewell the Open Mind" remarks on how the human mind forms its notions by mixing up its own nature with the

nature of things. He comments that when scientists engage in explicit theory development they use logical reasoning. But in the discovery phase that must precede the definitive process of creating a new theory, they often use illogical reasoning, reasoning that reflects their own subtle biases. He quotes Karl Popper:

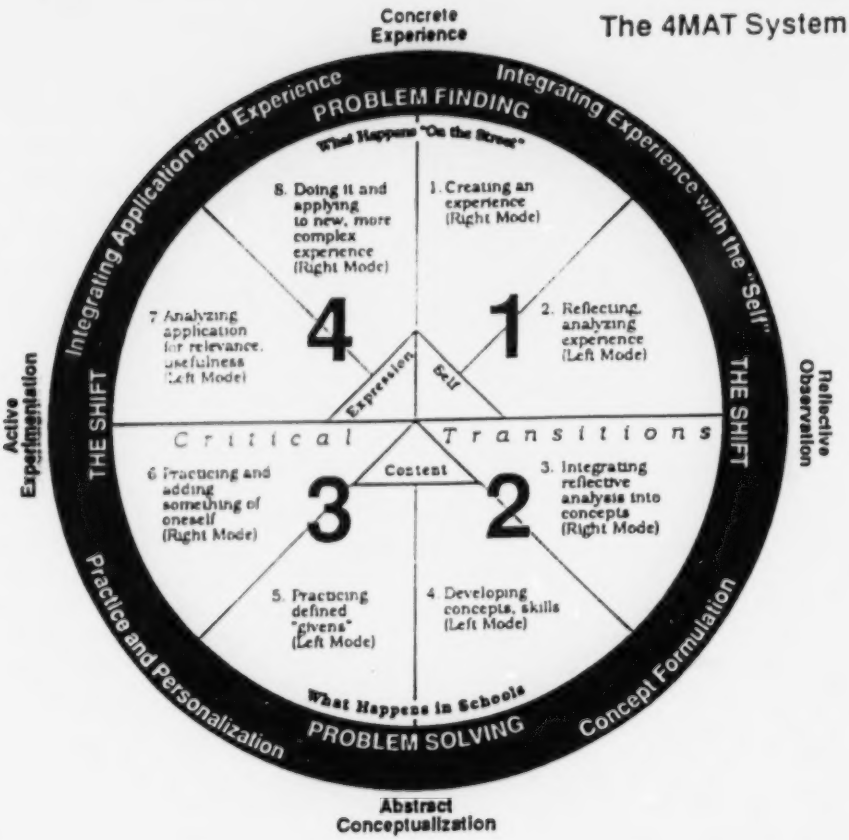
"Karl Popper, a modern philosopher who has written with great insight about the open mind, believes that we do not learn by observation, but by creating anticipations, sending up mental trial balloons. Such anticipations, guiding discovery, tilting the mind in a certain direction, amount to a kind of prejudice. What we expect to see influences what we actually do see, and what we find relevant or irrelevant. The process of discovery, as oppossed to the testing and criticism of a particular discovery, is never pure, never unbiased."[6]

So we approach learning with our whole minds, with our intuition, our beliefs, with our subjectivity intact. Schools need to engage the subjective mind more openly, with more honor. It is the whole brain that flexes and flows. If the left mode engages in analyses, breaks down, specializes, names things and agrees on the existence of these things, and if the right mode seizes upon the character of the whole, understands from experience, and grasps directly, then it is clear we need to honor both modes of processing in our schools. It is clear we need to engage the whole brain.

Our studies to determine the relationship between learning styles and brain dominance preferences indicate that each of the four learning styles quadrants has right-mode, left-mode, and whole-brained learners, although there is a strong tendency toward left-mode dominance in Quadrants Two and Three and a strong tendency toward the right- mode processing in Quadrants One and Four. But because there are right, left and whole-brained learners in each of the quadrants I made the decision to alternate right- and left-mode techniques through the four learning style cycle. This decision seemed to me to be a common sense approach to teaching. If all four learning styles are taught to all learners in a cycle that alternates from right-to left-mode information processing, and if in the doing all styles are equally valued, this integration will allow learners to be comfortable some of the time and stretched and challenged some of the time. And because it is clear that all of the learners need all of the cycle, the cycle then becomes more important than any one segment.

Each of the learning style types has a quadrant where s/he is most comfortable, where success comes easily. The Imaginative Learners prefer to learn by sensing/feeling and watching. The Analytic Learners prefer to learn by thinking and watching. The Common Sense Learners prefer to learn by thinking and doing. The Dynamic Learners prefer to learn by sensing/feeling and doing.

The 4MAT System provides a way for teachers to improve their instructional designs by using diverse strategies in a cycle of learning. This cycle needs to appeal to each learner's most comfortable style in turn, while stretching her/him to function in less comfortable modes. The movement around this circle is a natural learning progression. Humans sense and feel, they experience, then they watch, they reflect, then they think, they develop theories, then they try out theories, they experiment. Finally they evaluate and synthesize what they have learned in order to apply it to their next similar experience. They get smarter. They apply experience to experience.



4MAT is a learner-focused model for adapting curriculum and instruction to the diverse needs of students. It benefits teachers by giving them a framework to design learning in a systematic cycle. It benefits students by teaching to their underdeveloped skills while capitalizing on their strengths. When used in school districts over a mimimum two-year time span, (using the elements of successful training: released in-school time, feedback, peer coaching, etc.), interesting results occur. The following section describes these results.

The 4MAT Cycle as a Change System

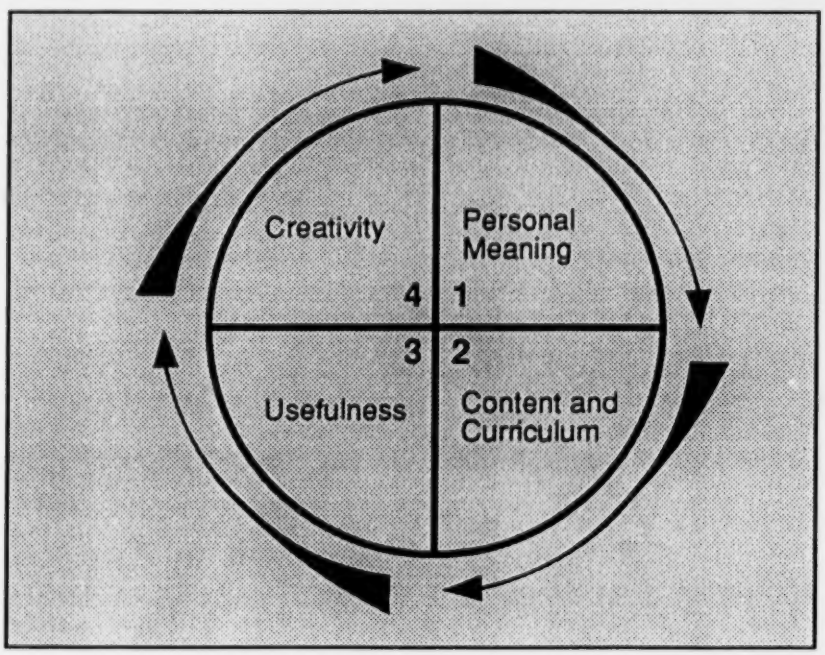
It is helpful to use the 4MAT quadrants to sketch out the desired outcomes of successful staff development. By examining the primary characteristics in each quadrant of the cycle, the role shifts teachers and learners pass through as they learn become apparent. Each quadrant has a different emphasis and these differences when put together make up a complete learning cycle, a cycle that is developmental and moves from subjective knowing to objective knowing to integrated knowing. (Kegan, 1982)[7] A cycle that can be used to design staff development strategies.

The emphasis in **Quadrant One** is **meaning**, or how the material to be learned is connected to learner's immediate lives. In learning style innovations, staff developers need to create activities that engage teachers in meaningful explorations of their relationships with their students, all their students.

The **Quadrant Two** emphasis is **content and curriculum** and how the presentation of that content and interconnectedness of curricula helps to forge connections for learners. The training must deal with curricula issues that tackle fragmentation and the ubiquitous coverage issue.

Quadrant Three deals with the **usefulness of learning** in the lives of the learners both in and out of school. It emphasizes the transferability of learning. Staff developers must design practice and feedback sessions using some version of peer coaching to help teachers transfer training successfully into their classroom practice. In addition, teachers need help in creating classroom environments that encourage tinkering and experimentation on the part of students.

Quadrant Four is concerned with **creativity,** how the learner adds to the original learning in new and unique ways. The selection and planning of innovative staff development requires that the innovation be adaptable: to different content areas, to different scheduling situations, to different content approaches, to different teachers, to different students.



Quadrant One: Attitude Shifts in Meaning

Part of the strength of what happens when we use the 4MAT cycle in staff development is that we begin by affirming what teachers already know about good practice. We begin with the teachers themselves, where they live, who they are, and how they learn (by having them find out their own best learning style). We are able to impact at a heart level as well as a head level and we get shifts in attitudes as a result. When we connect 4MAT principles to the immediate lives and concerns of the teachers, we see changes in three major and distinct areas. First, teachers' attitudes about diverse kinds of intelligence are broadened; second, attitudes about the act of teaching itself are changed; and third, the responsiblity for motivating students is accepted to a higher degree.

When teachers take the *Learning Style Inventory* (Kolb, 1971)[8] and the *Hemispheric Mode Indicator* for Left and Right Information Processing Preferences (McCarthy, 1986)[9], they are moved to examine their own styles of learning. They begin to address the issue of legitimate differences in learners through the eyes of their own preferences. The result is enhanced openness to these differences. Following this openness we find attitudes about the act of teaching itself also begin to change: teaching becomes more dialogue, less monologue, interactively undertaken as the exchange of different realities rather than the mere giving of information. So the diversity of students becomes a positive outcome, one that can be used to enhance learning. Referrals to the office for discipline problems dramatically decrease. The third difference we document is a deeper sense of responsibility on the part of teachers for motivating students. Teachers report a new urgency to create curiosity and interest in their students. They create Quadrant One "hooks" to get their students involved with the content. In addition, we can document shifts in teachers' attitudes towards their fellow teachers. We find professionalism rising and a new sense of collegiality emerging.

"There is a strong body of evidence which indicates that fellow teachers are often the preferred and most influential source of ideas." (Fullan, 1982)[10]

Teachers begin talking about instruction: conversations about the best way to introduce new concepts, reactions to student responses to right-mode techniques, comments about students becoming involved in the problem-solving aspects of the cycle, concerns about the difficulty of zeroing in on the best concepts (best in the sense of structurally important to the content itself and significant in its potentiality for making connections).
Teachers need practice when undertaking innovations and they need immediate feedback from that practice. The implementation strategy of Learning Partners[11] helps fill that need. We have found this strategy to be a powerful tool in helping teachers master 4MAT. One of the results from the learning partnerships is that new relationships are formed and the feedback sessions bring pairs of partners together to discuss and critique lesson units for improvement and refinement.

Quadrant Two: Changes in Content Approaches

As we examine the changes in teacher appoaches to content occuring in a 4MAT long range projects we find an increasing frustration with the fragmentation of the curriculum. This frustration seems to rise out of the creation of the 4MAT lessons or units themselves. The writing of a 4MAT lesson necessitates spotlighting the concepts or key issues that underlie the content. As teachers search for these significant issues they turn to concepts that connect several ideas together. This examination of key connectors raises the issue of fragmentation. Many dual fields of knowledge have emerged in our time: bio-engineering, neurophysiology, etc., yet our attempts to deal with curricula show few programs that merge content successfully. The resolution of this compelling issue can be exciting and engage high levels of thought. It can also be frustrating and confusing. The fragmentation question leads directly into the content coverage dilemma. 4MAT training exacerbates the content coverage issue.

"...the press to cover (content) offers little opportunity to develop that material in a way that will help students meet more authentic intellectual challenges. Most of us recognize the negative consequences of an addiction to coverage. We all want our curricula to foster fundamental understandings and complex, higher-order thinking. But despite our best intentions, we cannot break the habit." (Newman, 1988)[12]

As information expands, the curricula decisions become more difficult. While educators understand at some feeling level that we must move away from linear treatments of content, we remain unable to master the skills to treat content "roundly", conceptually. The ability to understand the structure of content fields is essential to making the conceptual choices necessary to teach to depth rather than coverage. Some of our teachers need help in understanding content areas in this higher-order way. Textbooks have not for the most part been written conceptually and of course our tests are not conceptual in approach either. Staff developers need to build in this kind of support and help for teachers as they move to concept approaches. Perhaps department chairs and supervisory personnel could begin this struggle, not made any easier by the fact that most of the concepts each of us forms come from our own personal experience. We must agree on some percentage of the concepts that form the best structural base for the content areas and we must constantly renew these choices. In our 4MAT Intermediate training, we have found it important and necessary to give teachers the time and assistance to conceptualize their content areas, and we have found the most success when teachers undertake this task together. It is a major curriculum and staff development piece in the learning style technology.

Quadrant Three: Changes in Strategies for Mastery

Quadrant Three calls for tinkering. It requires that learners check out the validity of the content they are being asked to master. We want our students to question, to ask, is this valid, does it work, what happens when it is applied to life outside of school? The 4MAT cycle requires that students begin to transfer what they are learning into their own lives. So this questioning, validating phase is a crucial step. It is learning used. First it is practice, then personalization. Without it there is no real learning.

"There is an inventive and informing power in action....the very act of moving from idea to reality brings additional mental and physical forces into play." (Bogue, 1985)[13]

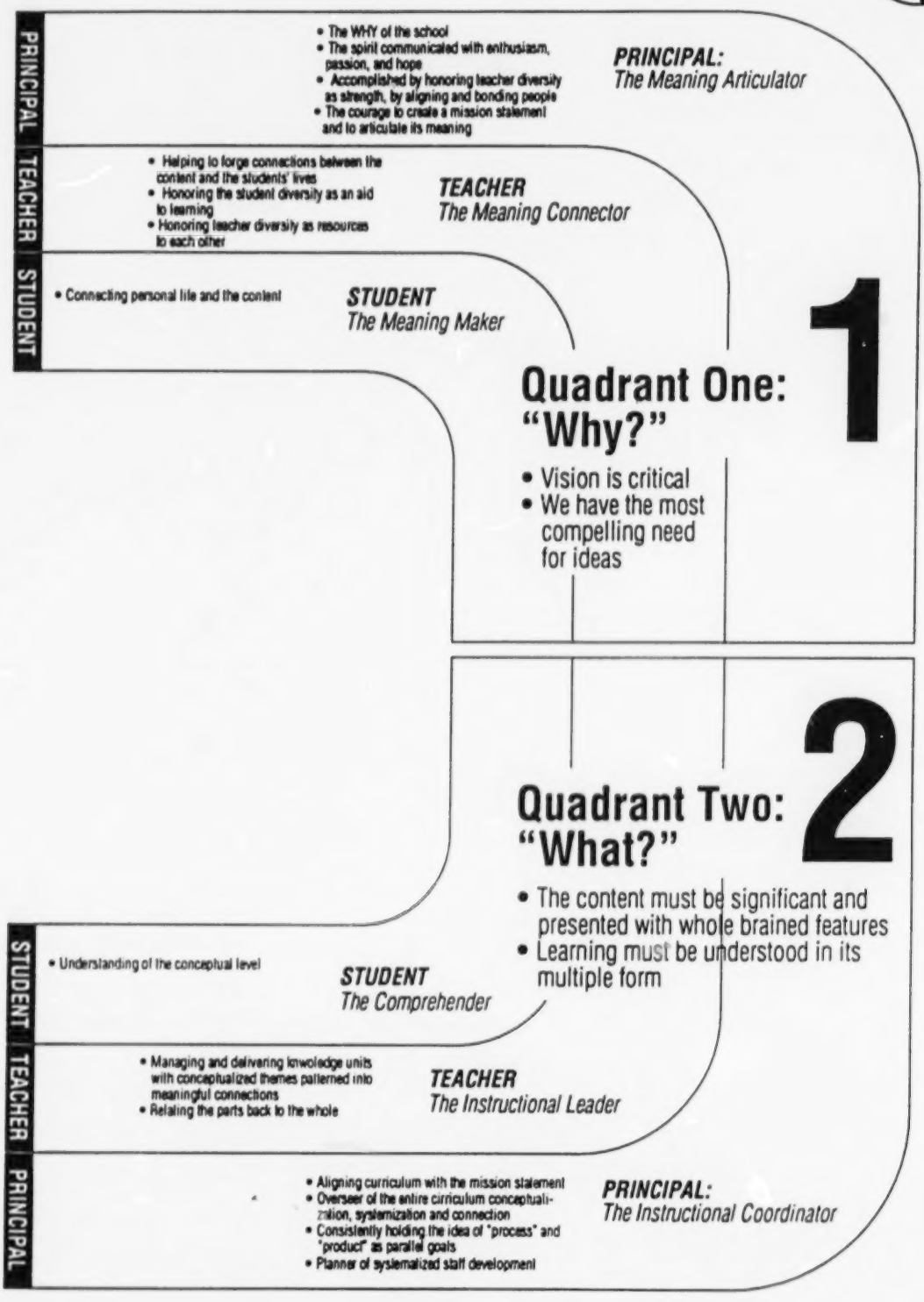
Teachers in the 4MAT projects must find activities that call for experimenting, for doing, for acting. These requirements go far beyond workbook pages and chapter questions. Teachers report a new sense of extension, of moving students from basic skills mastery to going beyond set content objectives. As learners tinker with applications of new learning and begin to take over the responsibility for the learning process, the risk of new teachable moments proliferates. Staff developers need to build in strategies for helping teachers to fulfill the additional role of coach and resource, on the sidelines as it were, rather than being more traditionally at the center of the education process. It is understandable that teachers need help in creating the risk environments that invite open-ended learner participation. And for some of our teachers, their own learning styles make this more difficult to master.

Quadrant Four: Changes in Evaluation Techniques

Two related changes occur in evaluation problems as the 4MAT long-range projects move into their second year: the inadequacy of present evaluation methods becomes obvious, and the need to assist learners in accepting greater responsibility for self-evaluation becomes clear.

A greater sense of the inadequacy of student evaluation methods is felt. As soon as teachers begin using 4MAT lessons, the issue of more comprehensive evaluation techniques emerges. 4MAT requires evaluation in all four quadrants, as well as in right- and left-mode activities. Most evaluation techniques used by teachers apply mainly to objective test items, and in some content areas, essay tests. Although essays are frequently assigned, teachers often have poorly developed notions about how to grade them. The evaluation techniques necessary to measure the 4MAT quadrants need to be devised and implemented by teachers if they are to require students to function in all four quadrants. This evaluation question is at the core of the necessary reform if learning styles are to become mainstreamed in our schools. Among the tasks implicit in creating additional evaluation techniques is the need to get teachers to accept the task of engaging in dialogue with colleagues to create standards of excellence, standards based on subjective judgments about what comprises excellence. This kind of dialogue is not generally undertaken in our schools, and the nature of objective testing has kept us from dealing with evaluation process issues, like: the clarity of conclusions, the insights brought to bear on a situation, and the elegance of a solution to a complex problem. The expansion of evaluation methods to include Quadrants One, Three and Four and right-mode processing activities is at the core of the implementation task if we are to mainstream learning styles technology in our schools. Our students know clearly that we measure what we value. And our present measurement methods are inadequate to the task of multiple ways of knowing.

Finally student self-evaluation needs to become a central piece of all evaluation. In Quadrant Four students are led to self-discovery. The chief responsibility for the learning has now shifted from the teacher in Quadrants One and Two, to the students in Quadrants Three and Four; in practicing and personalizing and then finally in creating and integrating. The essence of the Quadrant Four, the last piece in the cycle, is that students find original and creative ways to integrate the content learned into their lives and their communities. As trainers in learning style technology we need to assist teachers in ways to lead students back to themselves, to empower them to act on the knowledge we have taught them. And I am not speaking of loose, uneven standards. I mean we need to help our teachers teach their students high standards for original and creative work and hold them to this requirement.


PRINCIPAL
TEACHER
STUDENT
• The WHY of the school
• The spirit communicated with enthusiasm, passion, and hope
• Accomplished by honoring teacher diversity as strength, by aligning and bonding people
• The courage to create a mission statement and to articulate its meaning
PRINCIPAL:
The Meaning Articulator
• Helping to forge connections between the content and the students' lives
• Honoring the student diversity as an aid to learning
• Honoring teacher diversity as resources to each other
TEACHER
The Meaning Connector
• Connecting personal life and the content
STUDENT
The Meaning Maker
1
Quadrant One:
"Why?"
• Vision is critical
• We have the most compelling need for ideas
2
Quadrant Two:
"What?"
• The content must be significant and presented with whole brained features
• Learning must be understood in its multiple form
STUDENT
TEACHER
PRINCIPAL
• Understanding of the conceptual level
STUDENT
The Comprehender
• Managing and delivering knowledge units with conceptualized themes patterned into meaningful connections
• Relating the parts back to the whole
TEACHER
The Instructional Leader
• Aligning curriculum with the mission statement
• Overseer of the entire curriculum conceptualization, systemization and connection
• Consistently holding the idea of "process" and "product" as parallel goals
• Planner of systematized staff development
PRINCIPAL:
The Instructional Coordinator

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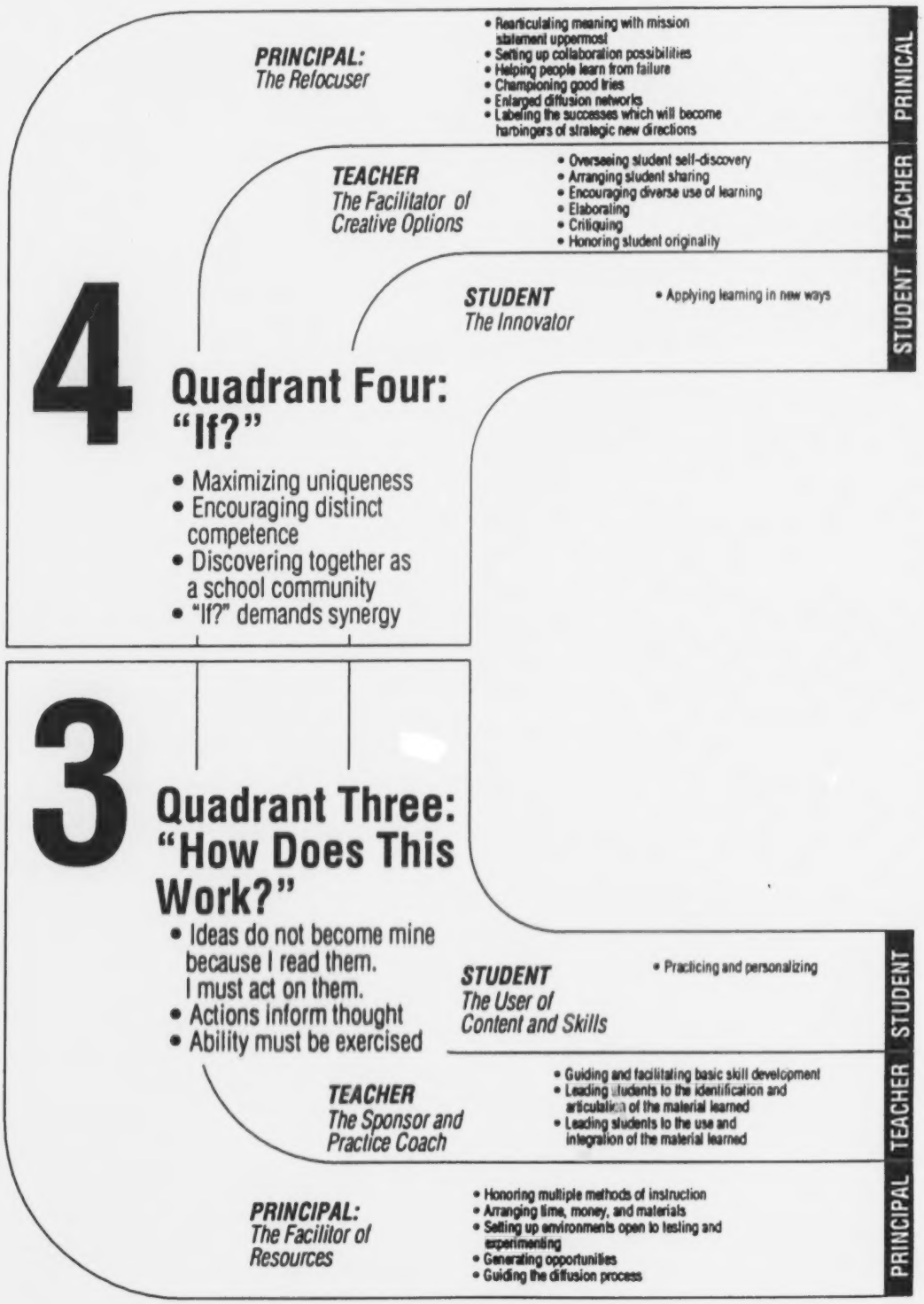
4
Quadrant Four: "If?"
• Maximizing uniqueness
• Encouraging distinct competence
• Discovering together as a school community
• "If?" demands synergy
PRINCIPAL: The Refocuser
• Rearticulating meaning with mission statement uppermost
• Setting up collaboration possibilities
• Helping people learn from failure
• Championing good tries
• Enlarged diffusion networks
• Labeling the successes which will become harbingers of strategic new directions
PRINICAL
TEACHER The Facilitator of Creative Options
• Overseeing student self-discovery
• Arranging student sharing
• Encouraging diverse use of learning
• Elaborating
• Critiquing
• Honoring student originality
TEACHER
STUDENT The Innovator
• Applying learning in new ways
STUDENT
3
Quadrant Three: "How Does This Work?"
• Ideas do not become mine because I read them. I must act on them.
• Actions inform thought
• Ability must be exercised
STUDENT The User of Content and Skills
• Practicing and personalizing
STUDENT
TEACHER The Sponsor and Practice Coach
• Guiding and facilitating basic skill development
• Leading students to the identification and articulation of the material learned
• Leading students to the use and integration of the material learned
TEACHER
PRINCIPAL: The Facilitor of Resources
• Honoring multiple methods of instruction
• Arranging time, money, and materials
• Setting up environments open to testing and experimenting
• Generating opportunities
• Guiding the diffusion process
PRINCIPAL

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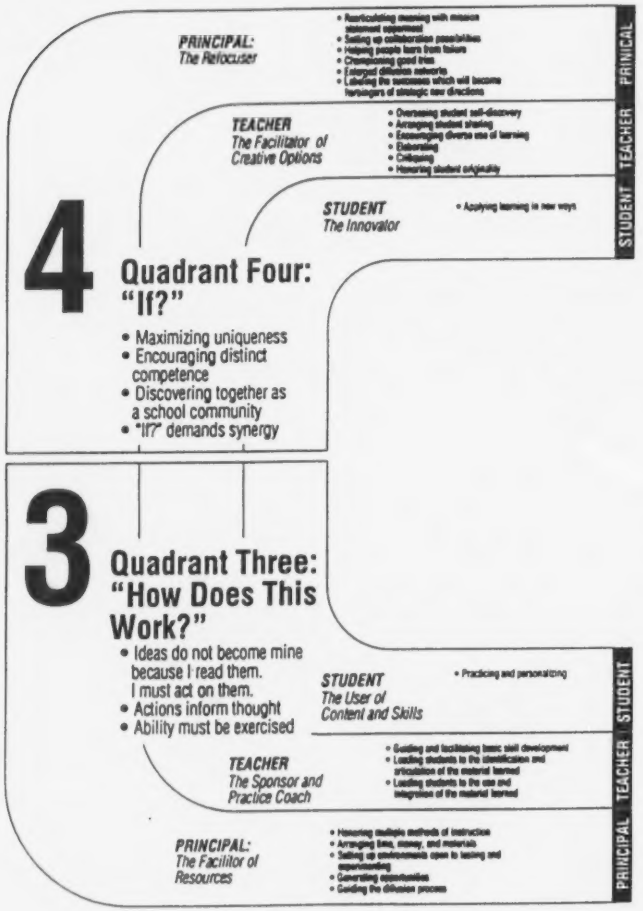

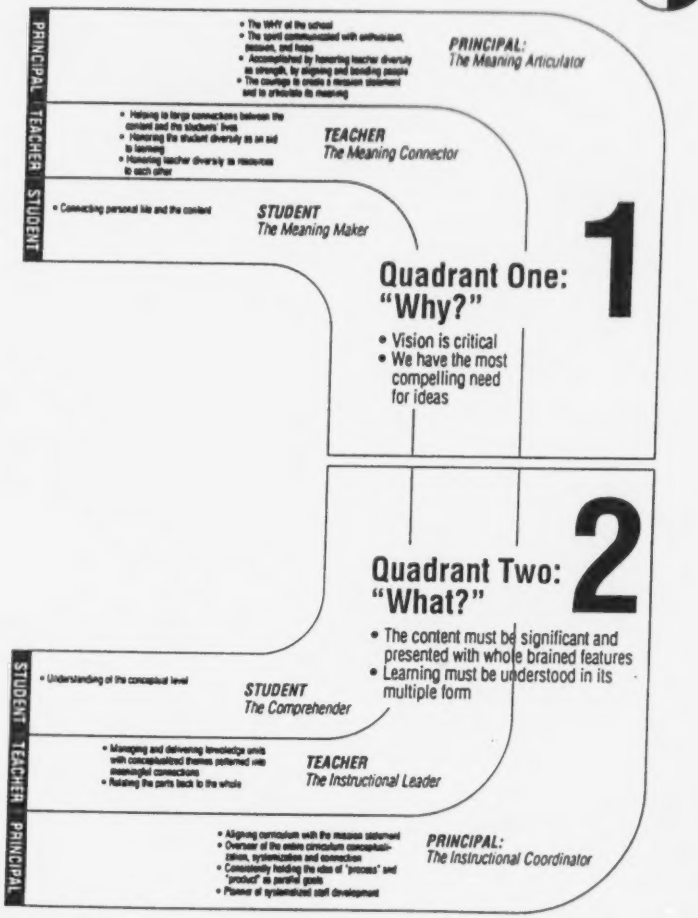

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The 4MAT Process as a Systems Approach

It is clear that the school is a system where the roles of principal, teacher and student impact on each other. Indeed, none of the above will happen unless administrators and staff developers take a systems approach to learning styles implementation. If we look at the 4MAT cycle from the perspective of these three groups we can gain some insight into the need for learning styles implementation to proceed as a systems approach.

(Put in "The 4MAT Process as System" — attached)

In Quadrant One, the principal articulates the meaning of the school through her/his vision, the teacher connects meaning to content and the students make meaning in dialogue with each other and their teachers, dialogue about content that connects to their lives.

In Quadrant Two, the principal is the instructional coordinator, aligning the curriculum with the mission statement, the teachers assume the roles of instructional leaders, (it is they after all who specialize in content), and the students are the comprehenders of that content.

In Quadrant Three, the student assumes the role of user of content and skills, the teacher becomes the coach and the principal becomes the facilitator of resources, honoring mulitple methods of instruction and arranging time, money and materials.

And finally in Quadrant Four, the students becomes the innovator, the teacher the facilitator of creative options, and the Principal the refocuser, setting up collaboration possibilities, coordinating evaluations, enlarging diffusion networks and rearticulaing meaning and mission.

Staff Development Issues Generated by 4MAT

1. Diverse forms of intelligence become an issue.
2. Teaching as dialogue among co-learners becomes a focus.
3. More responsibility for motivating students is accepted by teachers.
4. Teachers as decision-makers and instructional leaders becomes crucial.
5. Collegiality becomes necessary through learning partnerships.
6. The need to conceptualize content and form more connected curriculum becomes immediately clear.
7. The need to teach for learning transfer into students' lives outside of school becomes clear.
8. Multiple evaluation techniques become necessary.
9. Student self-evaluation becomes a necessary component.

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